CHAPTER 3
AIR TRAFFIC CONTROL

This chapter discusses the pathfinder air traffic controller, not the regular air traffic controller. The latter has radar and other sophisticated tools to monitor weather and guide aircraft. The pathfinder has only his training, so he can only advise and inform the pilot. Based on what the pathfinder tells him and on his own observations, the pilot must then decide whether to land, take off, or drop equipment or personnel.

Unless clearly stated otherwise, all mention here of "air traffic controller" refers to the pathfinder air traffic controller. Also, this chapter includes terms that are peculiar to ATC tasks.

Section I. PATHFINDER AIR TRAFFIC

The pathfinder air traffic controller uses radio or directional light signals to provide flight information, expedite traffic, and prevent collisions.

3-1. SAFETY

Pathfinders issue specific commands regulating vehicles, equipment, or personnel in the movement area. They help with search-and-rescue operations (STANAGs 2863 and 3281). They also promote the safe, efficient flow of air traffic by issuing clearances instructions, and information.

a. Pathfinders survey all visible air traffic operating within and around the airspace of the LZ, DZ, or airfield. They also bear the responsibility for all aircraft, vehicles, and personnel in the movement area of the LZ, DZ, or airfield.

b. Pathfinders acting as air traffic controllers (ATCs), provide control service by observing or knowing of traffic and airfield conditions that might constitute a hazard. These include--

- Surface conditions.
- Parachutists within control zones.
- Vehicular traffic.
- Temporary obstructions on or near the LZ, DZ, or airfield.
- Other aircraft.
- Enemy or friendly activities.

3-2. VOICE CONTROL

To communicate vocally, pathfinders and pilots must speak clearly and listen to each other. A clear, decisive tone of voice indicates control of the situation. Pilots may not trust instructions delivered in a vague or hesitant voice. To ensure that traffic flows safely and smoothly, the pathfinder must speak firmly and confidently, using standard words and phrases. Pathfinders use the phonetic alphabet to indicate single letters or initials, or to spell words, whenever similar sounds or difficulties in communication require them to do so.

a. Voice transmission offers a brief, concise, uniform flow of communication. The pathfinder controller must speak distinctly and pay special attention to numbers. When the accuracy of a message is doubtful, he repeats the complete message or essential parts.

Radiotelephone communicators use the following techniques to ensure clear understanding:

(1) Speak directly into the microphone.

(2) Speak in a normal, conversational tone.

(3) Vary your pitch-avoid speaking in a monotone.

(4) Speak at a comfortable speed-avoid speaking too slow or too fast.

(5) Keep your tone clear, professional, and firm. Avoid showing fear, indecision, anger, or other negative emotions in your tone of voice.

(6) Speak with confidence, especially in emergencies.

b. The pathfinder ATC must transmit messages only as necessary for control or help ensure safety. Specific procedures and control techniques vary, but the following rules apply regardless of the techniques used:

(1) The pathfinder issues instructions and information about all known traffic conditions.

(2) The pilot uses at lease one component of a standard traffic pattern (final approach), consistent with the pathfinder's instructions.

(3) The pilot has the final authority about whether or not to accept clearances issued by a controller.

3-3. FORMATS

A pathfinder controller uses the following formats and sequences for ground-to-air radio communication.

a. The pathfinder controller initially calls up an aircraft as follows:

(1) Identifies the aircraft he wishes to call.

(2) Says, "THIS IS."

(3) Identifies the calling unit.

(4) Identifies the type of message to follow (when this will help the pilot).

(5) Says, "OVER."

> Example: TANGO TWO SIERRA TWO SIX (T2S26), THIS IS CHARLIE
> THREE DELTA THREE SIX (C3D36) (short pause), OVER.

b. The controller replies to an aircraft's initial call-up in this sequence:

(1) Identifies the aircraft initiating the call-up.

(2) Says, "THIS IS."

(3) Identifies the pathfinder control unit.

(4) Says, "OVER." After establishing communications with an aircraft, shortens the transmission by using only the last three numbers (or letters) of each party's (his and the aircraft's) identification.

> Example: SIERRA TWO SIX, THIS IS DELTA THREE SIX, OVER.

c. The controller always starts a clearance (instruction) intended for a specific aircraft by identifying that aircraft. If he thinks that using the shortened identification could cause or is causing confusion, he can go back to using the full identification.

> Example: SIERRA TWO SIX, WIND CALM, CLEAR TO LAND, OVER.

d. The controller can omit "THIS IS" from the reply.

Example: SIERRA TWO SIX, DELTA THREE SIX, OVER.

e. The controller can omit the facility identification.

Example: SIERRA TWO SIX, TURN TO HEADING ZERO FOUR FIVE,
OVER.

f. Right after call-up, without waiting for the aircraft to reply, the controller can send a short message that he expects the aircraft to receive.

Example: SIERRA TWO SIX, EXTEND DOWNWIND, OVER.

g. If the message obviously requires a reply, he can omit "OVER."

Example: SIERRA TWO SIX, WHAT IS YOUR LOCATION?

h. To distinguish between similar aircraft identifications, he may emphasize appropriate numbers, letters, or words.

i. The controller never transmits to an aircraft during the final approach, touchdown, landing roll (touchdown), takeoff (liftoff), initial climb, or turnaway from the field. At these times, the pilot must concentrate on flying the aircraft. However, he transmits at once any condition or information that could affect the safety of the aircraft. Under no circumstances does the controller withhold from the pilot of an approaching aircraft any information about hazardous runways, fields, weather, or traffic conditions.

3-4. NUMBERS
A pathfinder controller transmits numbers by units or digits (Table 3-1, page 3-4).

3-5. PHRASES AND TERMS
A pathfinder controller uses particular phrases (Table 3-2, page 3-5) and terms (Table 3-3, page 3-6) to control and communicate with aircraft. He must know these phrases and how to use them.

Section II. LANDINGS
The safe landing of aircraft requires control of the airspace and grounds around the site. Managing air traffic involves using traffic patterns and maintaining separation of aircraft.

3-6. TRAFFIC PATTERNS
The pathfinder uses a traffic pattern to help manage airspace over his location, that is, in and around a landing site, airfield, LZ, or DZ (Figure 3-1, page 3-7). A traffic pattern normally extends out 1 mile from the final approach of the landing area in all directions, depending on the type of aircraft or size of the facility.

TO TRANSMIT	SAY
CEILING HEIGHTS and FLIGHT ALTITUDES	"CEILING FIVE HUNDRED" (one unit) or "CEILING FIVE ZERO ZERO" (digits for emphasis). "ALTITUDE ONE THOUSAND THREE HUNDRED" (two units) or "ALTITUDE ONE THREE ZERO ZERO" (in digits).
TIME	Use the word TIME followed by the number. For example, "0115 HOURS TIME, ZERO ONE ONE FIVE" or "1315 HOURS TIME, ONE THREE ONE FIVE."
ELEVATION NUMBERS	Use the words FIELD ELEVATION and the number. For example, for a 17-foot elevation, say, " FIELD ELEVATION SEVENTEEN." For a 50-foot elevation, say, "FIELD ELEVATION FIFTY."
WIND SPEED	Use the word WIND followed by compass direction and velocity (knots). For example, "WIND TWO SEVEN ZERO AT FIVE."
HEADING	Use the word HEADING followed by compass numbers (degrees); omit the word DEGREES. For example, "HEADING ONE TWO ZERO," "HEADING ZERO ZERO FIVE, " or, "HEADING THREE SIX ZERO." (The latter indicates a North [direction] heading.)

Table 3-1. Numbers transmitted by units or digits.

a.   In a normal (left) traffic pattern, the aircraft makes only left turns. The pilot keeps the airfield, landing site, LZ, or DZ to his left. In a right traffic pattern, the aircraft makes all right turns. The pilot keeps everything to his right.

b.   The controller uses traffic patterns to manage aircraft separation around a no-threat landing site. Rotary-wing aircraft can enter the pattern from any direction as long as they meet safety requirements. (Chapter 4 discusses fixed-wing procedures.) The height of the obstacles or aircraft requirements determines the altitude, which the controller can adjust as needed.

c.   While in the traffic pattern, the aircraft flies between 1,000 and 1,200 feet (known as *civil altitude*), though this may vary depending on the nature and requirements of the mission.

3-7. METHODS OF ENTRY
An aircraft may enter the traffic pattern from any point and direction within the area around the landing strip or zone, consistent with safety requirements.

a.   Fixed wing aircraft normally enter the traffic pattern in the first one-third of the closest leg, at an angle no greater than 45 degrees. Rotary wing aircraft may enter at any angle.

b.   A straight-in approach might work best if it falls within safety requirements. On a straight-in approach, the aircraft must remain within 30 degrees to either side of the land heading.

INTENT	EXAMPLE
Issue takeoff, liftoff, or departure clearance when delay is undesirable.	SIERRA TWO SIX, CLEARED FOR IMMEDIATE TAKEOFF (or DEPARTURE), OVER.
Issue takeoff (liftoff) clearance when aircraft is delaying on the runway.	SIERRA TWO SIX, TAKE OFF (or DEPART) IMMEDIATELY OR TAXI OFF THE RUNWAY, OVER.
Authorize a requested straight-in approach after issuing landing instructions.	SIERRA TWO SIX, STRAIGHT-IN APPROACH (to landing strip or LZ) APPROVED, OVER.
Authorize a right-hand traffic pattern.	SIERRA TWO SIX, RIGHT TRAFFIC APPROVED, OVER.
Issue the landing sequence.	SIERRA TWO SIX, YOU ARE NUMBER THREE TO LAND; FOLLOW THREE EIGHT FIVE (aircraft identification number) ON DOWNWIND, OVER.
Instruct pilot to extend downwind leg to obtain necessary aircraft separation.	SIERRA TWO SIX, EXTEND DOWNWIND FOR TRAFFIC SPACING, OVER.
Advise pilot of information not included in landing instructions, but important to aircraft safety.	SIERRA TWO SIX, BE ADVISED WE ARE RECEIVING AUTOMATIC FIRE FROM THE EAST, OVER.
Try to establish communication with and learn the identification of an aircraft in the area.	UNIFORM HOTEL ONE, TWO MILES WEST OF BLUE STRIP, STATE CALL SIGN, OVER.
Instruct pilot to circle the LZ or landing strip.	SIERRA TWO SIX, MAINTAIN LEFT (RIGHT) CLOSED TRAFFIC, OVER.
Issue clearance to land.	SIERRA TWO SIX, CLEAR TO LAND, OVER.
Instruct a pilot on his final landing approach that his clearance to land has been cancelled.	SIERRA TWO SIX, CONDUCT GO-AROUND, OVER.
Inform pilot to continue his approach to the landing area.	SIERRA TWO SIX, CONTINUE APPROACH, OVER.
Inform pilot of observed aircraft condition upon request or when necessary.	SIERRA TWO SIX, LANDING GEAR APPEARS DOWN AND IN PLACE, OVER.
Describe vehicles, equipment, or personnel in the movement area in a way that will help pilots see or recognize them.	SIERRA TWO SIX, AIRCRAFT TO LEFT OF RUNWAY, OVER. SIERRA TWO SIX, VEHICLES ON TAXIWAY, OVER.
Describe military traffic as appropriate.	SIERRA TWO SIX, BE ADVISED HELICOPTER ON DEPARTURE END, OVER. SIERRA TWO SIX, BE ADVISED, CHARLIE HOTEL FOUR SEVEN (CH-47) ON RIGHT SIDE OF RUNWAY, OVER.
Describe the relative positions of traffic using the clock direction-and-distance method.	SIERRA TWO SIX, UNIFORM SIX, YOUR THREE O'CLOCK, FIVE HUNDRED METERS, OVER.

Table 3-2. Phrases.

| TERM	MEANING
ABORT	Do not complete landing or takeoff (liftoff).
ACKNOWLEDGE	Did you receive and understand the message?
AFFIRMATIVE	Yes.
BE ADVISED	Indicates additional information is forthcoming, such as an unusual condition or hazard to flight.
BREAK	That is the end of my transmission to you. The following message is for another aircraft. OR That is the end of this part of the message. The next portion follows.
CONDUCT GO-AROUND	Do not land. Circle the landing area, and begin another approach.
CORRECTION	I gave you some incorrect information. The correct information follows.
EXECUTE	Drop personnel or equipment.
FORM YOUR OWN APPROACH.	You may enter the traffic pattern at your discretion. (Most suitable for aircraft with a sling load or for aircraft flights.)
GO AHEAD	Proceed with your message.
I SAY AGAIN	I am about to repeat my previous message.
LAST CALLING STATION	I do not know the identity of the station trying to establish communication.
MAYDAY	This is an emergency--clear the airways.
NEGATIVE	No.
NO DROP	Do not drop personnel or equipment.
OUT	That is the end of my transmission; you need not respond.
OVER	That is the end of my transmission; please respond.
READ BACK	Repeat message.
REPORT	Contact the control facility when you reach the location (or distance from the control station) that I am about to designate.
ROGER	I received and understand your transmission.
SAY AGAIN	Repeat your message.
STAND BY	Pause for a few seconds; (or) prepare to drop personnel or equipment.
STATE CALL SIGN	Identify your aircraft.
STATE INTENTIONS	Tell me your plans.
STATE LOCATION	Tell me your exact location.
UNABLE TO APPROVE	I must refuse your request.
VERIFY	Check with the originator.
WORDS TWICE	Communication is difficult; transmit each phrase twice.
WILCO	I understand and will comply.
YOU ARE UNREADABLE (BROKEN OR GARBLED)	I do not understand the transmission.

Table 3-3. Terms.
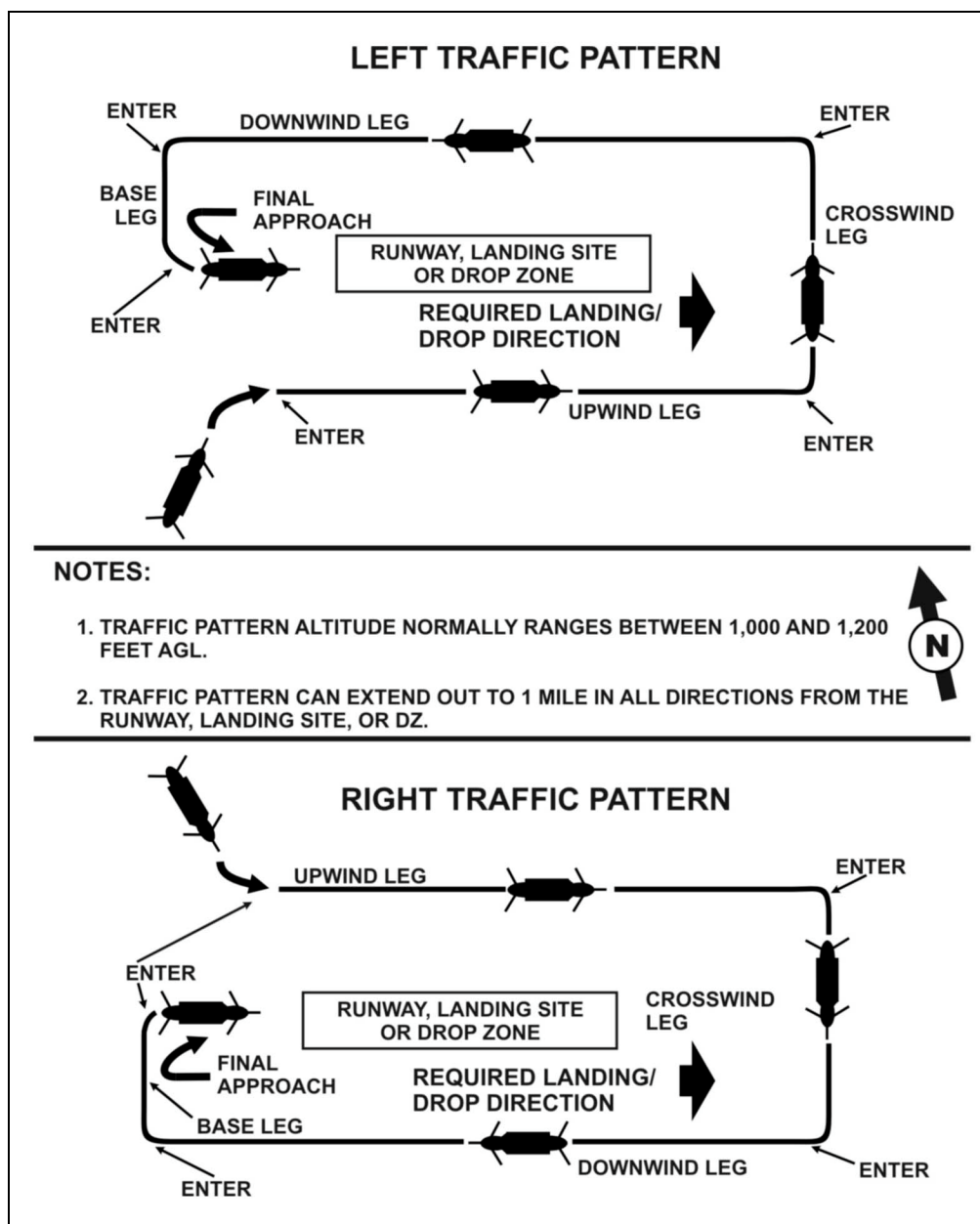
Figure 3-1. Air traffic patterns.

c. When circling to approach from any direction, the aircraft overflies the landing site then circles to the direction of landing. Normally, the pathfinder advises the pilot which direction to circle. This saves time and helps the aircraft avoid other traffic in the same airspace. The pathfinder most often encounters this type approach.

d. Departing aircraft normally leave on the same heading as landing aircraft, or as close to the same heading as they can, up to 45 degrees left or right of the land heading, depending on the wind direction. When the destination does not fall in the same direction as the departure, the aircraft may fly a portion of the traffic pattern. The pathfinder ensures that arriving and departing traffic do not conflict.

e.   The controller issues a "go-around" command when for some reason the aircraft should not land after the pilot reaches the final approach leg of the traffic pattern.

f.   The pathfinder uses closed traffic in either of two cases:

(1) When an aircraft does not land on the first approach.

(2) During DZ operations. When an aircraft must make more than one pass over the DZ, the pathfinder uses closed traffic.

3-8. TRAFFIC PATTERN LEGS

The traffic pattern has five possible legs. The pathfinder does not use them all at once. The pilot must at least fly the final approach leg, regardless of the type approach (Table 3-4).

a.   **Upwind Leg**. This flight course runs parallel to the land heading in the direction of landing.

b.   **Crosswind Leg**. This flight course runs at a right angle to the land heading, off its upwind leg.

c.   **Downwind Leg**. This flight course runs parallel to the land heading, in the direction opposite of landing.

d.   **Base Leg**. This flight course runs at a right angle to the landing runway off its approach, extending from the downwind leg to the intersection of the runway centerline (extended).

e.   **Final Leg (Approach)**. This flight course runs in the direction of landing along the runway centerline, extending from the base leg down to the runway.

LEG	FLIGHT COURSE	DIRECTION
UPWIND	Parallel to land heading	Landing direction
CROSSWIND	Right angle to land heading	Landing direction
DOWNWIND	Parallel to land heading	Direction opposite of landing direction
BASE	Right angle to landing runway	Extends from downwind leg to intersection of runway centerline (extended)
FINAL	Along runway centerline	Landing direction; extends from base leg down to the runway

Table 3-4. Traffic pattern legs.

3-9. ADVISORY SERVICE

The pathfinder controller issues advisories for the safe operation of aircraft in his area of responsibility. He may include such information as the temporary or permanent conditions on the landing field.

a.   Temporary conditions may include--

- Construction work on or immediately next to the movement area.
- Rough portions of the movement area.
- Degraded runway braking conditions due to ice, snow, mud, slush, or water.
- Parked aircraft on the movement area.

b. No two landing areas and situations are the same. Each location presents its own problems with respect to environmental conditions, peculiar weather, preferred landing directions, and so forth. For example--

(1) The final approach to a particular runway might require a higher-than-normal glide slope angle.

(2) Under certain wind conditions, unusual terrain features near the airfield can cause turbulence. This could threaten nearby aircraft. Helicopters also can create turbulence that could result in harm to light aircraft.

(3) Prohibited areas, mountains, or other obstacles directly in line with the end of the runway can require the pilot to turn the aircraft abruptly to the right after takeoff (liftoff).

(4) If friendly forces fire either artillery or mortars within the control zone, the pathfinder might need to tell the pilot the origin, range, direction, and maximum ordinate of the firing. He also tells the pilot about any air strikes in the control zone, especially those by high-performance aircraft. He also gives the pilot any available information about the enemy situation.

3-10. SPACING TECHNIQUES

Spacing provides more separation between aircraft in the traffic pattern. This relieves traffic congestion. The pathfinder controller uses two methods to obtain the required separation: the 360-degree turnout and the traffic pattern extension.

a. **360-Degree Turnout**. Except on the final approach, the pathfinder can issue instructions for the 360-degree turnout (a two-minute maneuver) at any point in the traffic pattern. When a pilot receives instructions to begin a 360-degree turnout, he turns away from the center of the landing site, makes a wide circle, and reenters the traffic pattern at about the same point where he left it (Figure 3-2 and Table 3-5 [both on page 3-10]). If the first turnout does not give him enough room, he might have to make more turnouts.

Pathfinder: DELTA THREE SIX, BEGIN THREE SIX ZERO DEGREE
TURNOUT FOR SPACING AND REPORT REENTRY.

Pilot: *ROGER. [After completing turnout] LIMA ONE SIX, DELTA
THREE SIX HAS REENTERED.*

Pathfinder: DELTA THREE SIX, ROGER, REPORT BASE.

Pilot: *ROGER.*

b. **Three Legs of Traffic Pattern**. The pathfinder can only extend the traffic pattern on three legs: upwind, crosswind, and downwind (Figure 3-3). He can only extend one leg at a time. He cannot extend the base leg or the final approach, because they run back into the traffic pattern itself. When giving instructions to extend the traffic pattern, the pathfinder includes the length of the extension. The extension normally measures twice the original length of that leg. The pathfinder takes care to ensure that he does not extend the leg so far that he loses visual contact with the aircraft.

3-11. FINAL LANDING INSTRUCTIONS

Final landing instructions consist of a current wind reading (direction and velocity) and clearance to land. The pathfinder includes any change to the situation in the final landing instructions, which he issues as soon as the pilot reports from the designated point. As a

rule, once the pathfinder clears an aircraft to land, he can only rescind that clearance in extreme situations.
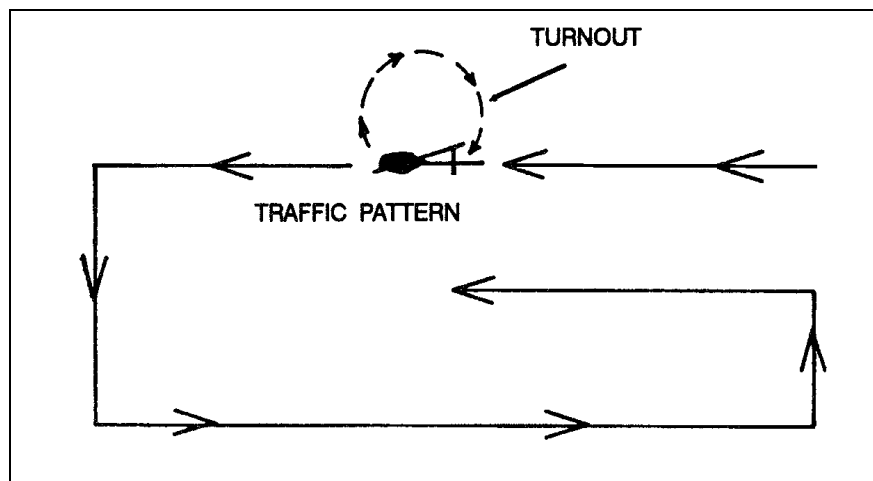

Figure 3-2. A 360-degree turnout.

SITUATION	REPORTING POINT
AIRCRAFT IN TRAFFIC	BASE LEG OF TRAFFIC PATTERN
STRAIGHT-IN APPROACH	FINAL
AIRCRAFT AUTHORIZED TO FORM OWN APPROACH	FINAL

Table 3-5. A 360-degree turnout.

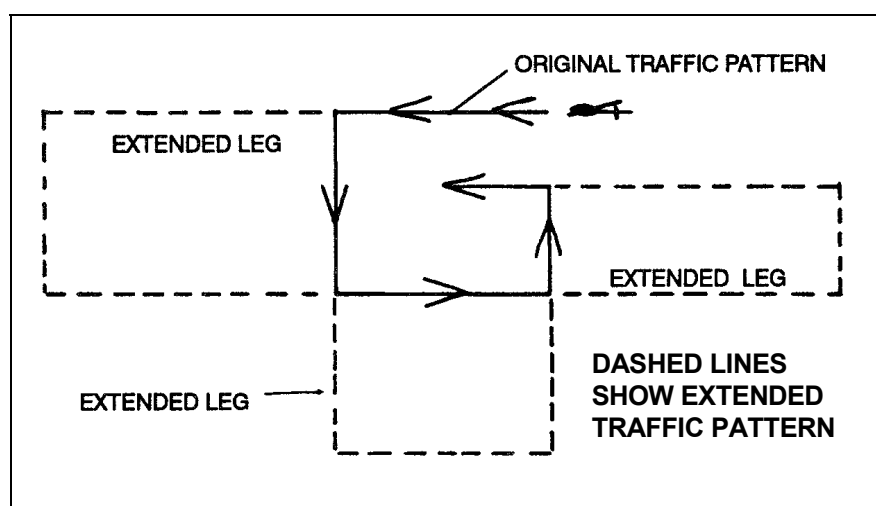**Figure 3-3. Traffic pattern extension.**

a. The best reporting points vary with the situation.

b. Aircraft flying in formation, except those flying in trail, and aircraft with a sling load usually form their own approach.

c. If two or more missions arrive at the same time, the controller gives first landing priority to in-flight emergencies, followed by MEDEVAC aircraft. He gives next priority to multiple aircraft and sling-loaded aircraft. Last priority goes to all other flights.

3-12. TAXIING AIRCRAFT

When issuing taxiing instructions, the pathfinder includes a route for the aircraft to follow in the movement area. He also includes instructions for the pilot to hold the aircraft at a specific point, if needed. The pilot moves the aircraft in the loading, maintenance, dispersal, or parking areas without the pathfinder's help but sometimes aided by signalmen.

a. The controller holds a taxiing aircraft short of an active runway by at least two airplane lengths. This ensures that landing aircraft have sufficient clearance.

b. The controller issues concise, easy-to-understand information.

> Example: SIERRA TWO SIX, TURN RIGHT AT SIGNALMAN.
>
> TANGO THREE SIX, TURN LEFT AT END OF
> RUNWAY, OVER.

3-13. MINIMUM AIRCRAFT SEPARATION REQUIREMENTS

During normal operations, pathfinders ensure pilots follow minimum separation criteria. Combat situations may dictate less separation (Figure 3-4, page 3-12).

a. **Arriving Aircraft**. The preceding aircraft (1) taxis off the landing strip before the arriving aircraft (2) crosses the approach end on its final glide (A, Figure 3-4, page 3-12).

b. **Departing Aircraft**. The preceding aircraft either crosses (1) the opposite end of the runway or turns away (2) from the projected path of the departing (3) aircraft before the latter begins its takeoff run (B, Figure 3-4, page 3-12).

c. **Departing and Arriving Aircraft**. The departing aircraft (1) crosses the opposite end of the runway before the arriving aircraft (2) crosses the approach end on its final glide path (C, Figure 3-4, page 3-12).

d. **Departing, Preceding, and Arriving Aircraft**. The preceding aircraft (1) and the arriving aircraft (2) both taxi off the runway before the departing aircraft (3) begins the takeoff run (D, Figure 3-4, page 3-12).

Section III. GROUND-TO-AIR COMMUNICATIONS

Air traffic control requires a rapid and efficient means of communication between aircraft and ground stations. Two-way radio offers the most efficient means, since it allows clear and rapid exchange of information. Not all aircraft have radios that work. A system of visual signals serves as a backup or standby means of communication when the control center or aircraft radio does not work or if the aircraft does not have the control frequency (Table 3-6, page 3-12). Pathfinders may also use colored smoke signals but must coordinate with the aviation unit so that the pilots will know what each color means.
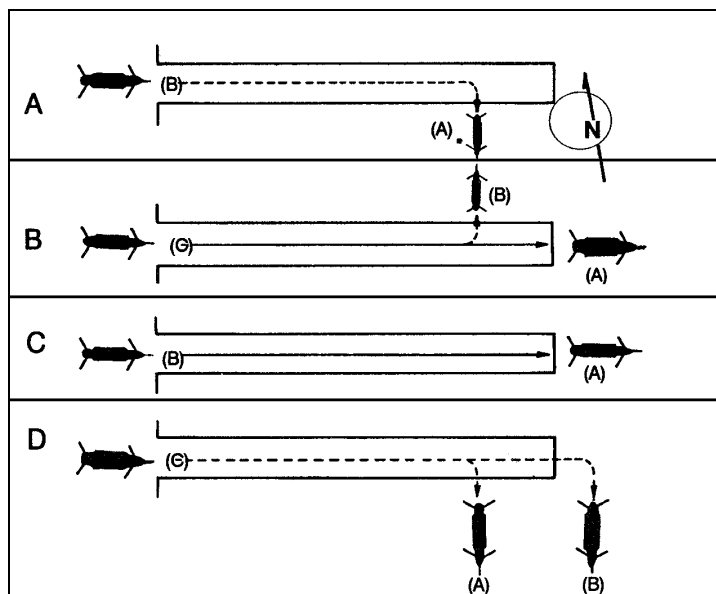
Figure 3-4. Minimum separation requirements.

3-14. ELECTRONIC WARFARE ENVIRONMENT

The pathfinder should expect an active EW environment for all operations. He should make sure he knows the proper ECCM. These include prowords that signal a switch to an alternate radio frequency, transmission authentication procedures, brevity codes, and required reports, when he suspects enemy interference. The pathfinder uses proper radiotelephone procedures and SOI during all operations.

COLOR AND TYPE OF SIGNAL LIGHTS	WHAT THIS MEANS TO AN AIRCRAFT ON THE GROUND	WHAT THIS MEANS TO AN AIRCRAFT IN FLIGHT
Steady green	Cleared for takeoff [or liftoff]	Cleared to land
Flashing green	Cleared to taxi	Return for landing [followed by a steady green light at the proper time]
Steady red	Stop	Give way to other aircraft and continue circling
Flashing red	Taxi clear of landing area of runway in use	Airport unsafe-- DO NOT LAND
Flashing white	Return to starting point [on airfield]	NA
Alternating red and green [general warning signal]	Use extreme caution	Use extreme caution
Red pyrotechnic [red flare]	NA	Do not land for the time being, despite previous instructions.

Table 3-6. ATC light signals on or near LZ.

a. To limit the possibility of compromise, the pathfinder reduces the electronic signature at the LZ or DZ. For this, he depends on thorough mission planning and coordination. He plans control procedures that enable him to execute the mission under radio listening silence. All pathfinder missions seek to achieve this goal.

b. Sometimes the pathfinder has little time to plan the mission. At other times, tactical or meteorological conditions may affect the operation. In either case, the pathfinder may have to use GTA communications to resolve possible conflicts between friendly airspace users and to advise them of previously unknown restrictive landing conditions. These conditions could include wind gusts, hazardous slopes, obstacles, soft landing surfaces, or a limited number of landing points. Training and close liaison with aviation aircrews enable the pathfinder to develop an understanding of what information pertains to the situation. This reduces transmission time.

c. The pathfinder manages any variation due to unknown influences just as he would manage any other exception to set procedure. The landing site is the variable most subject to change. Many conditions could require its relocation. For example, ground fog could cause a delay while the pathfinders move the site to a higher elevation.

(1) Before they know whether a site will support sufficient landing points or an assembly area for the ground unit, the pathfinders must first secure the site and conduct air and ground reconnaissance surveillance.

(2) If the mission is to reinforce or resupply a ground unit in contact, a change in the tactical situation could render the proposed location unsuitable. If the pathfinders locate the proposed site near enemy activity, they will most likely have to move it sometime between planning and execution to ensure that it continues to meet mission requirements.

d. Maintaining radio silence within the LZ is important. Because of this, most air movements require the establishment of a CCP. This ensures a common point from which the pathfinders and the aircraft can refer their relative positions and provide each other time to adjust to other changes.

e. The GTA net is reserved for communications, but the pathfinder cannot assume that all transmissions originate from aircraft. The headquarters in charge of flight plans logs all arrivals so they will know if an aircraft does not arrive at its destination on time. When this happens, they contact intermediate stop points to identify the last known location and to aid in search-and-rescue operations.

3-15. GROUND-TO-AIR TRANSMISSIONS

The pathfinder may encounter endless situations while using GTA. If he can master the following four most common ones, he can handle most situations:

a. **Situation 1--Known Aircraft Location**.

(1) *Initial Contact*. The pilot radios transmission at coordinated time and location. After establishing two-way communications, the controller may abbreviate call signs. With multiple flights, instructions issued by pathfinder GTA communication should identify the particular situation by including that station's call sign at the beginning of the transmission.

Pilot: *ALPHA ONE LIMA ONE SIX [A1L16], THIS IS ROMEO TWO BRAVO TWO SEVEN [R2B27], OVER.*

Pathfinder: ROMEO TWO BRAVO TWO SEVEN, THIS IS ALPHA ONE LIMA ONE SIX, OVER.

Pilot: *THIS IS BRAVO TWO SEVEN, CCP INBOUND, OVER.*

Pathfinder: THIS IS LIMA ONE SIX, STATE TYPE, NUMBER, AND INTENTIONS, OVER.

Pilot: *THIS IS BRAVO TWO SEVEN, FOUR UNIFORM HOTEL SIXTIES [UH-60s], TROOP DROP-OFF AND SLING LOAD, FOR YOUR SITE, OVER.*

Pathfinder: THIS IS LIMA ONE SIX, ROGER, HEADING THREE TWO FIVE [325], THREE THOUSAND [3,000] METERS. LAND THREE TWO FIVE, SIGNAL ON CALL, LAND ECHELON RIGHT, SLING-LOAD AIRCRAFT USE NUMBER FOUR LANDING POINT, CONTINUE APPROACH FOR VISUAL CONTACT, OVER.

(2) *Air Traffic Control Information*.

Example: HEADING THREE TWO FIVE, [distance] THREE THOUSAND METERS, OVER. LAND THREE TWO FIVE, OVER.

(3) *Pertinent Information*.

Example: SIGNAL ON CALL [prepare to establish positive visual contact].

FOUR UNIFORM HOTEL SIXTIES [UH-60s] IN ECHELON RIGHT [advises pilot of the size of landing site].

SLING-LOAD POINT ON NUMBER FOUR TOUCHDOWN POINT [night only].

FIELD ELEVATION, FOUR TWO FIVE FEET [actual field elevation].

(4) *Advisory Information*. See Table 3-7.

TYPE OF ADVISORY	INFORMATION INCLUDED
FLIGHT	The enemy situation, if it presents a threat to the aircraft.
LANDING	Surface conditions on the landing site such as the presence of sand, mud, or blowing snow.
DEPARTURE	Obstacles in the path of aircraft leaving the site [obstacles above the obstacle departure lights].

Table 3-7. Information included in advisories.

(5) *Aircraft in Sight*.

Pathfinder: BRAVO TWO SEVEN, THIS IS LIMA ONE SIX, I AM AT YOUR TWELVE O'CLOCK, FIVE HUNDRED METERS, IDENTIFY SIGNAL, OVER.

Pilot: *THIS IS BRAVO TWO SEVEN, I IDENTIFY GREEN SMOKE, OVER.*

(a) At night, during specialized activities such as external load drop-off or pickup, or when unsafe surface conditions require pathfinders to mark specific landing points, the flight leader must know all arrangements so he can organize the flight for landing. Pathfinders identify the site by using a light gun to flash a dot-dash sequence.

Pathfinder: THIS IS LIMA ONE SIX, VISUAL CONTACT [and, once the pilot identifies the site], WIND THREE TWO FIVE AT EIGHT, CLEAR TO LAND, OVER.

(b) Once the pilot identifies the site, the pathfinder issues final landing instructions. If the controller already has other aircraft flying in a traffic pattern, he places the incoming aircraft into the traffic pattern at a safe and convenient location. Then, he instructs the pilot to report base. When the pilot reports base, the pathfinder issues final landing instructions. For special situations, instead of placing the aircraft in the traffic pattern, the controller may tell the pilot to circle left or right. Then the controller will issue final landing instructions.

(6) *Departure Instructions*. If the departure heading differs from the land heading, the controller gives the departure heading as the first element of the departure instructions.

Pilot: *LIMA ONE SIX, THIS IS BRAVO TWO SEVEN, READY FOR DEPARTURE, OVER.*

Pathfinder: THIS IS LIMA ONE SIX, WIND THREE TWO FIVE AT EIGHT, CLEAR TO DEPART, STATE INTENTIONS, REPORT CLEAR OF LANDING ZONE, OVER.

Pilot: *THIS IS BRAVO TWO SEVEN, RIGHT BREAK, AFTER DEPARTURE, OVER.*

Pathfinder: THIS IS LIMA ONE SIX, ROGER, OVER.

Pilot: *THIS IS BRAVO TWO SEVEN, CLEAR TO THE WEST, OVER.*

Pathfinder: THIS IS ALPHA ONE LIMA ONE SIX, ROGER, OUT.

b. **Situation 2--Aircraft Reporting from a Cardinal Direction and Distance**.
(1) Often, units conduct mutually supporting helicopter operations to increase the security of an LZ operation. For example, a team of observation and attack helicopters may screen the LZ. Because no aircraft plan to land there, and because the utility or lift aircraft know the LZ and screen team's location from communications over internal UHF or VHF radio nets, the screening helicopters need not contact the pathfinder. However, if they learn an aircraft does need to land at the LZ, the screening helicopter team responds differently to initial contact.

(2) Due to a possible conflict with aircraft departing the landing site in the same direction, the pathfinder must track the inbound aircraft's course and advise mission aircraft of the unexpected arrival. To accurately track the aircraft and control the situation, the pathfinder uses a commonly known point in the direction of the aircraft. He can use a prominent terrain feature, a checkpoint, or an aerial control point previously established by the ground unit for maneuver control. This situation matches Situation 1 exactly, except that the controller does not give the aircraft's heading and distance.

c. **Situation 3--Aircraft with In-Flight Emergency**.

(1) An in-flight emergency occurs when an aircraft develops a mechanical problem that challenges the pilot's ability to maintain control. Because the pilot must focus on the problem with the aircraft, the pathfinder helps by moving other air traffic away from the one having the problem, which has first priority. If the emergency develops before initial contact, OPSEC requires a full information exchange, just like in a standard transmission.

(2) After the pilot declares the emergency, the situation continues as follows:

Pilot:	*ALPHA ONE LIMA ONE SIX [A1L16], THIS IS CHARLIE ZERO WHISKEY ZERO TWO [C0W02], IN-FLIGHT EMERGENCY [MAYDAY], OVER.*
Pathfinder:	THIS IS LIMA ONE SIX, WIND ZERO THREE FIVE AT SIX, CLEAR TO LAND, STATE INBOUND HEADING, OVER.
Pilot:	*THIS IS WHISKEY ZERO TWO, HEADING TWO SIX ZERO, OVER.*
Pathfinder:	ALL STATIONS, THIS IS ALPHA ONE LIMA ONE SIX, BE ADVISED, IN-FLIGHT EMERGENCY APPROACHING FROM THE EAST, REMAIN CLEAR OF LANDING SITE AND MAINTAIN RADIO SILENCE UNTIL EMERGENCY HAS BEEN TERMINATED - BREAK - WHISKEY ZERO TWO, CAN I BE OF FURTHER ASSISTANCE, OVER.
Pilot:	*THIS IS WHISKEY ZERO TWO, NEGATIVE, OVER.*
Pathfinder:	THIS IS LIMA ONE SIX, ROGER, OVER.

(3) The controller tells the emergency aircraft of any aircraft that remain on the landing site.

Pathfinder:	WHISKEY ZERO TWO, BE ADVISED, TWO UNIFORM HOTEL ONES ON NORTH END OF SITE.

(4) Only the pilot who originally declared the emergency can terminate that same emergency. Once the pilot does so, the pathfinder transmits a net call to inform all stations that normal operations can continue.

Pathfinder:	ALL STATIONS, THIS IS ALPHA ONE LIMA ONE SIX, EMERGENCY HAS TERMINATED, I CAN ACCEPT TRAFFIC, OVER.

(5) Departure instructions are the same as those given for Situation 1.

d. **Situation 4--Disoriented Aircraft**.

(1) During limited visibility, adverse weather, in-flight emergencies, or when he has no map, a pilot may not know the location of the landing zone. Also, he may not see any easily identifiable land point. In such cases, the pathfinder can help the pilot by directing him either to a known location or to the LZ. At terrain flight altitudes, and in some environments, the pilot may experience disorientation of as little as 200 meters. The pathfinder may hear but not see the aircraft. Pilots who have FM homing equipment onboard may use that to orient themselves during the initial contact, without having to

ask for a long or short count. Because it requires the ground station to increase transmissions, FM homing risks loss of SIGSEC.

(2) In this example, an aircraft at the CCP cannot establish voice communication with the pathfinder due to low altitude or radio interference. Knowing the landing zone location, but unsure of the exact location of the landing site, the pilot continues his flight closer to the center of the zone.

Pilot:	*ALPHA ONE LIMA ONE SIX [A1L16], THIS IS CHARLIE TWO ECHO THREE FOUR [C2E34], OVER.*
Pathfinder:	CHARLIE TWO ECHO THREE FOUR, THIS IS ALPHA ONE LIMA ONE SIX, OVER.
Pilot:	*THIS IS ECHO THREE FOUR, FOUR UNIFORM HOTEL ONES [UH-1s] ARE INBOUND FOR LANDING, REQUEST NAVIGATIONAL ASSISTANCE, OVER.*
Pathfinder:	THIS IS LIMA ONE SIX, DO YOU HAVE FM HOMING CAPABILITY?
Pilot:	*THIS IS ECHO THREE FOUR, AFFIRMATIVE, OVER.*
Pathfinder:	THIS IS LIMA ONE SIX, SHORT COUNT FOLLOWS: 1-2-3-4-5-5-4-3-2-1. END SHORT COUNT, STATE INBOUND HEADING, OVER.
Pilot:	*THIS IS ECHO THREE FOUR, SAY AGAIN, OVER.*
Pathfinder:	THIS IS LIMA ONE SIX, ROGER, ORBIT PRESENT LOCATION, DESCRIBE PROMINENT TERRAIN FEATURES, STATE LAST KNOWN LOCATION, HEADING, AND DISTANCE FLOWN, OVER.
Pilot:	*THIS IS ECHO THREE FOUR, CCP HEADING THREE SIX ZERO, TWO THOUSAND METERS, I SEE A THREE-ACRE POND WITH DAM ON THE SOUTH, ORIENTED EAST-WEST, OVER.*
Pathfinder:	[Plots the course correction and continues with the standard transmission.] THIS IS LIMA ONE SIX, HEADING TWO NINE ZERO, EIGHT HUNDRED METERS, [gives advisories if any], OVER.

(3) The standard ATC information continues as in Situation 1 and ends with--

Pathfinder:	DESCRIBE PROMINENT TERRAIN FEATURES EN ROUTE, OVER.